# Gauges and Indicators (L4)

## – How the Circuit Works

The indicator lights are controlled by different conditions in their associated systems. Refer to each associated system to see its entire schematic.

### Engine Coolant Temperature Gauge ('98-'99)

The engine coolant temperature gauge has two intersecting coils wound around a permanent magnet rotor. Voltage applied to the coils, through fuse 9 (in driver's under-dash fuse/relay box), generates a magnetic field. The magnetic field, controlled by the coolant temperature sending unit, causes the rotor to rotate and the gauge needle to move. As the resistance in the sending unit varies, current through the gauge coils changes, moving the gauge needle toward the coil with the strongest magnetic field.

The coolant temperature sending unit's resistance varies from about 137 ohms at low engine coolant temperature to between 30-46 ohms at high temperature (radiator fan running).

Refer to the Service Manual (Section 10, Cooling System) for specific tests or troubleshooting procedures.

### Engine Coolant Temperature Gauge ('00-'02)

The engine coolant temperature gauge has two intersecting coils wound around a permanent magnet rotor. Voltage applied to the coils, through fuse 9 (in driver's under-dash fuse/relay box), generates a magnetic field. The magnetic field, controlled by the ECM or PCM causes the rotor to rotate and the gauge needle to move. As the ECM or PCM varies the current, current through the gauge coils changes, moving the gauge needle toward the coil with the strongest magnetic field.

Refer to the Service Manual (Section 10, Cooling System) for specific tests or troubleshooting procedures.

### Fuel Gauge

The fuel gauge has two intersecting coils wound around a permanent magnet rotor. Voltage applied to the coils, through fuse 9 (in driver's under-dash fuse/relay box), generates a magnetic field. The magnetic field, controlled by the fuel gauge sending unit, causes the rotor to rotate and the gauge needle to move. As the resistance in the sending unit varies, current through the gauge coils changes, moving the gauge needle toward the coil with the strongest magnetic field.

The fuel gauge sending unit's resistance varies from about 3-5 ohms at full to about 106 ohms at empty. When you turn the ignition switch to LOCK (0), the gauge remains at the last reading until you turn the ignition switch to ON (II) or START (III) again.

Refer to the Service Manual (Section 11, Fuel Supply System) for specific tests or troubleshooting procedures.

### Low Fuel Indicator Light

**⚠ WARNING**

**Do not smoke while working on the fuel system. Keep open flame away from the work area. Drain fuel only into an approved container.**

A thermistor is mounted in the fuel tank unit. When the thermistor is cool, its resistance is very high. When the thermistor's temperature increases, its resistance decreases. Fuel in the fuel tank transfers heat away from the thermistor fast enough to keep it cool so the thermistor's resistance stays high and the low fuel indicator light does not come on. When the fuel level drops below the thermistor, the thermistor's temperature increases. With less and less fuel to cool it, the thermistor's resistance decreases, eventually allowing current to flow through the low fuel indicator light and the thermistor to ground, which turns on the low fuel indicator light.

Refer to the Service Manual (Section 11, Fuel Supply System) for specific tests and troubleshooting procedures.

### Speedometer and Odometer

The odometer and speedometer drive circuits receive pulses from the vehicle speed sensor (M/T) or PCM (A/T). The pulse rate increases as the car accelerates. The frequency and duration of these input pulses are measured and displayed by the speedometer, odometer, and tripmeter.

### Tachometer

The tachometer drive circuit receives pulses from the PCM or ECM. The solid-state tachometer then displays these pulses as engine speed. For each 200 pulses per minute from the PCM or ECM the tachometer displays 100 RPM.

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# Gauges and Indicators (L4)

**Vehicle Speed Sensor (M/T only)**

With the ignition switch in ON (II) or START (III), battery voltage is supplied through fuse 6 (in driver's under-dash fuse/relay box) and the BLK/YEL wire to the vehicle speed sensor. The sensor is grounded at G101. The speedometer and other control units in the circuit supply 5 volts or more to the BLU/WHT wire. The vehicle speed sensor intermittently grounds the BLU/WHT wire which generates a pulsed signal in it. The number of pulses per minute increases/decreases with the speed of the car.

Refer to the Service Manual (Section 22, Body Electrical) for specific tests and troubleshooting procedures.

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